<u>IN THE CLAIMS</u>:

Please amend the claims as follows.

Claim 1 (currently amended): An operation device ~~having one or more encoders, operation means~~ for ~~operating one or more outputs of the one or more encoders, and one or more decoders for decoding one or more outputs of the operation means, and~~ replacing one or more operations of an original operation system defined on first representation data, with one or more operations of a new operation system ~~of the operation means~~ defined on second representation data, ~~characterized in that~~ <u>the operation device comprising</u>:

<u>one or more encoders for converting input represented on the first representation data into input represented on the second representation data, which one or more encoders function as injective mappings $\Phi : B_r{}^n \to B_r{}^m$;</u>

<u>operation means for operating the input represented on the second representation data, the input being received from the one or more encoders, which operation means operates as one or more unary operations $G^q{}_N: B_r{}^m \to B_r{}^m$ of the new operation system corresponding to $G^q{}_O$, as one or more binary operations $\mathsf{F}^p{}_N: B_r{}^m \times B_r{}^m \to B_r{}^m$ of the new operation corresponding to $\mathsf{F}^p{}_O$, and/or as one or more T-nary operations</u>

$H^s{}_N$: $B_r{}^m \times B_r{}^m \times \cdots \times B_r{}^m \to B_r{}^m$ of the new operation system corresponding to $H^s{}_O$; and,

one or more decoders for converting output represented on the second representation data received from the operation means, into output represented on the first representation data, which one or more decoders function as surjective mappings $\Psi : B_r{}^m \to B_r{}^n$;

wherein, a set of the first representation data of the original operation system is a set $B_r{}^n$ (a direct product of n sets B_r of r values) with a base number of r and a word length of n such as to satisfy $\max\{|\Omega_{G^q} in|, |\Omega_{F^p} in|, |\Omega_{H^s} in|, |\Omega_{G^q} out|, |\Omega_{F^p} out|, |\Omega_{H^s} out|\} \le r^n$, where $|\Omega_{G^q} in|$, $|\Omega_{F^p} in|$, $|\Omega_{H^s} in|$, $|\Omega_{G^q} out|$, $|\Omega_{F^p} out|$, $|\Omega_{H^s} out|$ are cardinal numbers of one or a plurality (Q+P+S>=1) of finite sets $\Omega_{G^q} in$, $\Omega_{F^p} in$, $\Omega_{H^s} in$, and $\Omega_{G^q} out$, $\Omega_{F^p} out$, $\Omega_{H^s} out$ for input space and output space of the original operation system in which original operation system Q unary operations G^q: $\Omega_{G^q} in \to \Omega_{G^q} out$ $(q = 1, 2, \cdots,$ Q,), and/or P binary operations

F^p: $\Omega_{F^p} in \times \Omega_{F^p} in \to \Omega_{F^p} out$ $(p = 1, 2, \cdots, P)$, and/or S T-nary operations

F^p: $\Omega_{F^p} in \times \Omega_{F^p} in \to \Omega_{F^p} out$ $(p = 1, 2, \cdots, P)$ are defined;

unless $|\Omega in| = r^n$ for a cardinal number $|\Omega in|$ of a set of data Ωin (any of $\Omega_{G^q} in$, $\Omega_{F^p} in$, $\Omega_{H^s} in$) of input space of any of the operation of the

original operation system, relationships for $r^n - |\Omega|$ undefined elements are added to the any of the operation of the original operation system;

the Q unary operations G^q of the original operation system are extended to unary operations $G^q{}_O$: $B_r{}^n \to B_r{}^n$ $(q = 1,2,\cdots,Q)$, the P binary operations F^p is extended to binary operations $F^p{}_O$: $B_r{}^n \times B_r{}^n \to B_r{}^n$ $(p = 1,2,\cdots,P)$, and the S T-nary operations H^s is extended to T-nary operations $H^s{}_O$: $B_r{}^n \times B_r{}^n \times \cdots \times B_r{}^n \to B_r{}^n$ (the number of direct products is T, $s = 1,2,\cdots,S$);

the second representation data is data on a set $B_r{}^m$ ($m \geq n$);

~~the one or more encoders function as injective mappings~~ $\cancel{\Phi : B_r{}^n \Rightarrow B_r{}^m}$~~;~~

~~the one or more decoders function as surjective mappings~~ $\cancel{\Psi : B_r{}^m \Rightarrow B_r{}^n}$~~;~~

~~the operation means operates as one or more unary operations~~ $\cancel{G^q{}_N\text{: } B_r{}^m \Rightarrow B_r{}^m}$ ~~of the new operation system corresponding to~~ $\cancel{G^q{}_O}$~~, as one or more binary operations~~ $\cancel{F^p{}_N\text{: } B_r{}^m \times B_r{}^m \to B_r{}^m}$ ~~of the new operation corresponding to~~ $\cancel{F^p{}_O}$ ~~, and/or as one or more T-nary operations~~ $\cancel{H^s{}_N\text{: } B_r{}^m \times B_r{}^m \times \cdots \times B_r{}^m \Rightarrow B_r{}^m}$ ~~of the new operation system corresponding to~~ $\cancel{H^s{}_O}$~~;~~

whereby all operations of the original operation system, ~~and~~ all operations of the new operation systems, the encoders and the decoders ~~of the new operation system~~ are related to mappings of an r- value logic type having plural inputs and outputs; and,

further wherein, a code $[X]([X] \subset B_n{}^m)$ corresponding to every one of X on $B_r{}^n$ satisfies following expressions (1) to (5),

(1) $\Phi(X) \in [X] \subset B_r{}^m$ (for $\forall X \in B_r{}^n$)

(2) $\Psi([X]) = X$ (for $\forall X \in B_r{}^n$)

(3) $Y = G^q{}_O(X) \Leftrightarrow [Y] \supset G^q{}_N([X])$ (for $\forall X, Y \in B_r{}^n$, $\forall q$)

(4) $Z = F^p{}_O(X,Y) \Leftrightarrow [Z] \supset F^p{}_N([X],[Y])$ (for $\forall X, Y, Z \in B_r{}^n$, $\forall p$)

(5) $Y = H^s{}_O(X_1, \cdots, X_T) \Leftrightarrow [Y] \supset H^s{}_N([X_1], \cdots, [X_T])$ (for $\forall X_1, \cdots, X_T, Y \in B_r{}^n$, $\forall s$).

Claims 2-14 (canceled).